Plato's Enigma and Experimental Digital Humanities

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Attempt of the eProject.

Plato's Enigma and Experimental Digital Humanities

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Motivation : New Digital Reception of Classics in 2000s can suggest a possibility of solution of the most enigmatic problems of Classics as well as development of the new kind of Second – Generation Experimental Digital Humanities.

Introduction

Historically speaking, the first dialogue between humanists and mathematicians was initiated not by digital humanists of the late 1940s (R.Busa), but by Zeno's criticism of the Pythagorean mathematics which was reinforced by Plato's *Parmenides*, philosophers of Plato's Academy, Aristotle and the *Elements* of Euclid.

Thus,all possible applications of Computer sciences, Turing automata theorems, Computer Arts and Supercomputer computations in today's Humanities and Social Sciences (i.e. what usually is constituting "Digital Humanities ") are merely continuation of ancient dialogue of scientists and humanists in some fundamental sense.

As is known, experimental Quantum Physics of 1990s rediscovered the significance of Zeno and Plato as the originators of the whole developments in science.After two thousand years of continual refutation of Zeno's sophisms and Plato's One - Many problem taking ancient arguments seriously were reinstated, and, even made impact into the foundations of quantum Renaissance in modern information theory, theory of quantum computers, quantum cryptography (Quantum Zeno Effect was discovered in 1977 by B.Misra, and E.Sudarsham – see, Facchi *et all,* 2009).

This means that we are cooperating right now and new opportunities of Digital Humanities just have broadened our appreciation of how different cultures of knowledge can cooperate in the 21st century.

Digital Humanities -2

Today's Digital Humanities is usually considered as rapidly evolving area of applications of computational analysis methods to archive large collections of works of arts and literature in a digital format. Digital Humanities also is defined as a methodology to investigate how knowledge is produced with new computer technologies in Humanities in the 21st century. (Raben,1991;Hockney, 2004; Piez,2008).

We may suppose, however, that Digital Humanities – **2** (**DH** of the Second Generation) can be realized as an attempt to find more deeper cooperation between Humanities and Computer sciences in investigation of the most fundamental Humanities's assumptions of supposedly exact sciences set aside. Such kind of assumptions like Zeno's paradoxes and Plato's number theory had endured for more than twenty centuries , but after two thousand years of refutations modern science and mathematics are rediscovering their importance again.

Following modern science standard we can use supercomputer/ computer experiments to test these assumptions, but not to reject them as "pure scientific matter ". A striking example of it is Plato's periodic perfect numbers, introduced first in Republic 8 (**546cd**) and usually ignored by scholars and translators.

DH-2Project Plato's periodic perfect numbers

Suddenly one night in May after 17 years of silence underground as nymphs *Magicicada sepdendum* (Periodical Cicadas) emerge to fill the air with their raucous noise. Their incredible ability to merge by the millions within a matter of hours and to disappear shortly after having spent 17years underground is without parallel in the animal kingdom ...

Similar observation, but in earlier political anthropology , not zoology, was made first by Plato in his puzzling passage **546cdBook8** of *Republic* : after 12.960.000 unknown time units (James Adam, 1891; 2009) certain loss of vital power of the states and some destructive "X-generations" suddenly might emerge again. In accordance with *Republic* 8, at the same time after "fatal" period comprehended by Plato's periodic perfect number "Divine Men" with supernatural power (M.Ficino, 1496) should emerge also.

Correspondingly, new Callipolis, new timocracy, new oligarchy, new democracy and new tyranny in good agreement with some esoteric logic of innate and genetically coded human clock (ultra-long rhythmic cycle) might arise - again and again - in human history.

Despite all attempts of generations of historians, translators, and, even professional mathematicians (including Euler, Berneoulli) to compute Plato's "fatal" numbers and to reconstruct Plato's " Nuptial Arithmetic " during last two thousand years, conjecture remains unsolved.

Following M. Ficino's *De Numero Fatali* (Allen, 1994)there must exist not one, but two different Plato's *mathemata* : " Divine" arithmetic **(D-**arithmetic) of periodic perfect numbers defined " the three distances and four limits " of historical metamorphose and "Nuptial" arithmetic (**N-**arithmetic) considering the ways of calculation of the *Platonicus annus* or Plato's Great Cycle based on non-trivial interpretation of Pythagoras theorem.

In 1999 I made attempt to reconstruct Plato's **D-**arithmetic using new concepts of modern additive number theory. I supposed that iff this periodicity (" Plato's periodic perfect numbers ") will work as expected, it might be computable in computational (and supercomputational) experiments.

My results, published in *Bulletin des Sciences Mathematiques* I (1999) showed an unexpected existence of some beautiful mathematics behind of Plato's hypothesis, where surprisingly simplified forms of the even perfect numbers, neglected possibility of the odd perfect numbers (please see Appendix 1) as well as ultimate existence of merely three periodic perfect numbers (496, 33550336 and 2658459915698311744654692615953842176) are really amazing argument in defence of "mysterious" Plato's anthropology . Recent exploration of the world of Plato's arithmetic led me to the puzzling existence of cubic groups and new unexpected simplification of Riemann hypothesis (2010).

My eProject (Popov, 2011) on history of **546cdb8** enigma attempts to find explanation of the most famous Plato's mystery in 21st century as well as to invite mathematicians and digital humanists to participate in my further (I afraid very expensive) Supercomputational experiment in the search of possible violations of Plato's theorem with sufficiently large even perfect numbers expressed by several millions of digits.

References

Adam J. The Nuptial Number of Plato: Its solution and significance. C.J.Clay and Sons, Cambridge University Press,1891.

Adam J. Appendix. In : The Republic of Plato. Vol2, Books VI-X. Editor J. Adam. Cambridge University Press, 2009.

Allen M. *Nuptial Arithmetic.* Marsilio Ficino's commentary on the Fatal number in Book VIII of Plato's Republic. University of California Press, 1994.

Facchi P, Pascazio S. *Quantum Zeno dynamics: mathematical and physical aspects*. - arXiv: 0903.3297v1(2009).

Hockney S. *The history of Humanities Computing.* In:S. Schreibman, R.Siemens,J.Unsworth (Eds) A Companion to Digital Humanities. Oxford: Blackwell (2004),pp 3-19.

Piez W. *Something Called "Digital Humanities" Digital Humanities Qua* Summer 2008,v2n1

Popov M.A. *On Plato's periodic perfect numbers.* In :Bulletin des Sciences Mathematiques. v.123,1999, pp 29-31.

Popov M. A. Cubic Groups *Cryptology ePrint Archive 2010 / **653***

Popov M.A. Plato's Enigma. Lulu Publisher, 2011/http://www.lulu.com/product/ebook/platos-enegma/15525910/

Raben J. *Humanities Computing 25 years later.* Computers and the Humanities, 1991, 25(6).

Appendix 1

$2^1(2^2-1) = 2^3 - 2^1$

$2^2(2^3-1) = 2^5 - 2^2$

$2^4(2^5-1) = 2^9 - 2^4$

$2^6(2^7-1) = 2^{13} - 2^6$

$2^{12}(2^{13}-1) = 2^{25} - 2^{12}$

$2^{16}(2^{17}-1) = 2^{33} - 2^{16}$

$2^{18}(2^{19}-1) = 2^{37} - 2^{18}$

$2^{30}(2^{31}-1) = 2^{61} - 2^{30}$

$2^{60}(2^{61}-1) = 2^{121} - 2^{60}$

$2^{88}(2^{89}-1) = 2^{177} - 2^{88}$

$2^{106}(2^{107}-1) = 2^{213} - 2^{106}$

$2^{126}(2^{127}-1) = 2^{253} - 2^{126}$

$2^{520}(2^{521}-1) = 2^{1041} - 2^{520}$

$2^{606}(2^{607}-1) = 2^{1213} - 2^{606}$

$2^{1278}(2^{1279}-1) = 2^{2557} - 2^{1278}$

$2^{2202}(2^{2203}-1) = 2^{4405} - 2^{2202}$

$2^{2280}(2^{2281}-1) = 2^{4561} - 2^{2280}$

$2^{3216}(2^{3217}-1) = 2^{6433} - 2^{3216}$

$2^{4252}(2^{4253}-1) = 2^{8505} - 2^{4252}$

$2^{4422}(2^{4423}-1) = 2^{8845} - 2^{4422}$

$2^{9688}(2^{9689}-1) = 2^{19377} - 2^{9688}$

$2^{9940}(2^{9941}-1) = 2^{19881} - 2^{9940}$

$2^{11212}(2^{11213}-1) = 2^{22425} - 2^{11212}$

$2^{19936}(2^{19937}-1) = 2^{39873} - 2^{19936}$

$2^{21700}(2^{21701}-1) = 2^{43401} - 2^{21700}$

$2^{23208}(2^{23209}-1) = 2^{46419} - 2^{23208}$

$2^{44496}(2^{44497}-1) = 2^{88993} - 2^{44496}$

$2^{86242}(2^{86243}-1) = 2^{172485} - 2^{86242}$

$2^{110502}(2^{110503}-1) = 2^{221005} - 2^{110502}$

$2^{132048}(2^{132049}-1) = 2^{264097} - 2^{132048}$

$2^{216090}(2^{216091}-1) = 2^{432181} - 2^{216090}$

$2^{756838}(2^{756839}-1) = 2^{1513677} - 2^{756838}$

$2^{859432}(2^{859433}-1) = 2^{1718865} - 2^{859432}$

$2^{1257786}(2^{1257787}-1) = 2^{2515573} - 2^{1257786}$

$2^{1398268}(2^{1398269}-1) = 2^{2796537} - 2^{1398268}$

$2^{2976220}(2^{2976221}-1) = 2^{5952441} - 2^{2976220}$

$2^{3021376}(2^{3021377}-1) = 2^{6042753} - 2^{3021376}$

$2^{6972592}(2^{6972593}-1) = 2^{13945187} - 2^{6972592}$

$2^{43112608}(2^{43112609}-1) = 2^{86225217} - 2^{43112608}$